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# Update on Water Quality

United States Department of Agriculture

## Progress Update #4, May 21, 1990

### USDA Announces Midwest Research Initiative

The Research Committee of the USDA Working Group on Water Quality has chosen five areas overlying aquifers in nine Midwestern States as primary locations for new water quality research. The research will lead to better understanding of the dynamics of groundwater contamination by agricultural chemicals and better practices and technologies for lessening the risk of contamination.

Scientists from the Agricultural Re-

search Service, State Agricultural Experiment Stations (working with Cooperative State Research Service Special Grants), and U.S. Geological Survey will conduct collaborative research. State and local agricultural, natural resources, and environmental agencies and the U.S. Environmental Protection Agency will cooperate. The researchers will consult farmers, community leaders, local agribusiness interests, and environmental groups at each site.

### Why the Midwest?

The Midwest is one of the most intensively farmed regions of the U.S. It produces more than half of all U.S. corn and soybeans—crops that normally are grown with large inputs of pesticides and fertilizers. Some pesticides used by the region's

farmers have been detected in groundwater. Midwestern groundwater is also vulnerable to contamination by nitrate nitrogen. The lessons of the Midwest, therefore, should have broad national significance.

### Cooperation With USGS

USDA's Midwest Initiative is a combined effort with the U.S. Geological Survey's Mid-Continent Herbicide Initiative. A Program Management Team from ARS, the State Agricultural Experiment Stations, USGS, and the Environmental Protection Agency is providing overall coordination and management for the initiative.

In general, USDA and State research will focus on the upper, unsaturated part of

the soil, including the rooting zone; USGS will emphasize the underlying unsaturated soil and parent material and the saturated groundwater system. However, at times both USDA and USGS researchers will likely work in all parts of the hydrologic continuum. USDA, State, and USGS researchers together will address questions of chemical interactions with the entire environment, not just groundwater.

### Study Areas

A USDA panel selected five research proposals to establish Management Systems Evaluation Areas (MSEA's) for the Midwest/Mid-Continent Initiative. Criteria for selection included: Past and present farming systems; climatic, soil, topographic, geological, and groundwater characteristics; and expected collaboration in support, planning, and implementation.

MSEA's will allow scientists to evaluate the performance of management systems on field- to farm-size units—areas large enough to support economically and environmentally significant agricultural production systems. Associated research

projects of focused experiments, designed for more precise measurements or more intensive sampling, will also be carried out.

Full characterization of sites and installation of sampling equipment, instrumentation, and cropping systems will begin this growing season. Most MSEA's will be fully operational by next year, and the rest by 1992.

Primary study areas will be located in Iowa, Minnesota, Missouri, Nebraska, and Ohio. Research associated with the Minnesota site will be conducted in North Dakota, South Dakota, and Wisconsin.

## Objectives

The Midwest/Mid-Continent Initiative will evaluate the influence of farming practices and systems on groundwater quality and assess the economic and social characteristics of various farming systems needed for enhancement of water quality. As with any research, the ultimate goal is technology transfer. Consequently, the nationwide network of water quality demonstration projects, special projects, and hydrologic

unit areas will provide further testing grounds and points of technology transfer for systems tested on the MSEA's.

Technology transfer is built into the MSEA's. The Cooperative Extension System and the Soil Conservation Service are involved in program planning, and they are developing education and action programs that will tie in with the MSEA's.

## Other Research

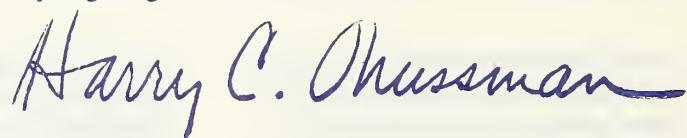
The Midwest Initiative is only part of ongoing USDA research on water quality. The USDA Water Quality Research Plan, published in January 1989, calls for two distinct kinds of research. *Geographically focused systems research* includes regional initiatives such as the Midwest Initiative.

The second kind of research, called *Priority components research*, includes:

- Obtaining information on the basic physical, chemical, and biological processes that determine movement of contaminants through soil into groundwater;
- Developing new farm management practices;
- Identifying the climatic, soil, and hydrogeologic variables that affect

groundwater contamination from agricultural practices.

Priority components research at State Agricultural Experiment Stations (supported by CSRS Special Grants) and in ARS is investigating sources and prevention of contamination; breakdown and transport of agricultural chemicals; remediation; socioeconomic implications of changing farming practices; and agricultural management and water quality. Additionally, ongoing research in the Economic Research Service and in the States is addressing the economic implications of various farming and policy alternatives at farm, regional, and national scales.



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